

Balms of Gilead than is that species. Attacked trees may have the majority of leaves almost completely veined by the feeding of the adults alone.

Control.

Natural.—Egg parasites are numerous, particularly in *Z. abnormis*. A minute Hymenopterous fly was reared from attacked eggs, which has been determined as a Mymarid. Over 40 per cent. of the eggs of *abnormis* examined contained various stages of this parasite.

One specimen of a hymenopterous parasite only was found in large numbers of larvæ examined.

Artificial.—Experiments in spraying infested trees with Lead Arsenate or Paris Green indicated that the latter would prove more successful. It is a more rapid killer, thus reducing oviposition by the females after feeding on it.

The following spray gave good results; Paris green, 1 oz.; slack lime, 4 oz.; water, 10 gallons. Care must be taken that the spray is directed to the under-side of the leaves, which necessitates the use of an angle nozzle, and the work must be done as soon as the beetles appear in sufficient numbers to indicate that the trees will suffer later in the season.

It is useless to spray with Paris green when the leaves begin to turn black. The spraying of only a few trees, however well done, in a badly infested area can at best diminish by a small amount the attack on those particular trees. This is due to the flying ability of the beetles. Were the majority of the trees in the district sprayed early in the season most of the beetles would be poisoned while they were feeding on various trees before selecting leaves for oviposition towards the end of June.

THREE NEW CRANE-FLIES FROM EASTERN CANADA.

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Late in the fall of 1917, I received from Dr. A. G. Huntsman, Curator of the Atlantic Biological Station, St. Andrews, N.B., a small collection of crane-flies, taken by him at Eastern Harbour, Cape Breton Island, N.S., and Amherst Island, Magdalen Islands, Que. Aside from the three species here described as new, the following species were represented:—*Limnophila inornata* O. S., Eastern Harbour, July 1st, 7 ♂'s; *Limnophila adusta* O. S., Eastern Harbour, July 4. 1 ♀; *Pachyrina pedunculata* Loew, Eastern Harbour, July 1st, 1 ♂; *Pachyrina ferruginea* Fabr., Amherst Is., July 15; Eastern Harbour, July 20, 5 ♂'s, 2 ♀'s; *Tipula angulata* Loew, Eastern Harbour, July 1st, 1 ♂, 2 ♀'s; *Tipula trivittata* Say, Amherst Is., July 15, 1 ♂; *Tipula caloptera* Loew, Eastern Harbour, July 1st, 1 ♀; *Tipula latipennis* Loew (*ottawaensis* Dietz), Amherst Is., July 15, 1 ♂; *Tipula rohweri* Doane, Amherst Is., July 12, 1 ♂; *Tipula inermis* Doane, Amherst Is., July 15, 2 ♂; and *Tipula tephrocephala* Loew, Eastern Harbour, July 1st, 1 ♂, 2 ♀'s.

Limnophila magdalena, n. sp.*

Black with a grayish bloom. Very similar to *Limnophila barberi* Alex. Legs dusky yellow, femora infuscate at apex only.

*Types of the new species are in the author's collection.
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Male.—Length 10 mm.; wing 10 mm. Head, mouth-parts, palpi and antennæ black; rostrum short; antennæ short, first joint long with grayish bloom above, second joint broadly subconic, joints three to five a little wider than the following joints and, like the latter, moniliform, outer joints somewhat elongate; the whole antennæ thinly clothed with short, black hairs, shorter than the respective joints. Front and occiput with a grayish bloom and, especially the latter, beset with black hairs. Neck three-quarters the length of front and occiput, transversely subrugulose.

Thorax concolorous, subglabrous; the usual stripes are subfoveate, the median stripe of equal width with an irregular, grayish median line; the interspaces with grayish bloom and a row of short, grayish hairs, directed outwardly; the grayish bloom is more dense on the posterior portion of the præscutum, so as to obscure the limitations of the stripes. Scutum, scutellum and postnotum with grayish bloom. Pleura with grayish bloom, dorso-pleural membrane obscurely yellowish. Halteres entirely pale, yellowish. Legs of moderate length and robustness, sordid yellow with black pilosity; coxæ yellowish-brown, darker anteriorly; anterior and middle femora infusate in apical fifth the posterior in the apical fourth; apices of tibiæ and outer tarsal joints infusate. Wings light brownish, costal portion more yellowish; veins brown, cord and vein *Cu*, *Cu*₂ and *A*₂ seamed with brown; *Sc*₂ on a line with the base of cell *R*₂; *Rs* long, slightly curved at its base, *R*₂₊₃ very short, scarcely longer than *Sc*₂, cross-vein *r* at the tip of *R*₁; the bases of cells *R*₂₊₃ and *R*₄₊₅ approximately in a line, cell *M*₁ about as long as its petiole; basal deflection of *Cu*, near the middle of cell *1st M*₂; stigma elongate, quadrate, dark brown.

Abdomen dark brown; tergites two to four, somewhat reddish in the middle portion and thinly clothed with whitish hair. Hypopygium concolorous; the ninth tergite strongly narrowed posteriorly with a small, rounded median emargination. Pleurites large, hairy; the upper appendages dark testaceous, broadening for three-fifths their length, thence narrowed and ending in a denticiform point, the inner margin of the outer two-fifths strongly denticulate; the lower appendage broad in basal portion, and ending in a sharp point.

Holotype.—♂, Amherst Island, Magdalen Islands, Quebec, July 15th, 1917. (A. G. Huntsman).

Distinguished from *L. barberi*, which appears to be its nearest ally, by its larger size, brownish wings, dark brown stigma and veins *Cu* and *Cu*₂ strongly seamed with fuscous. The front femora are reddish-yellow, with only the apex infuscated.

***Limnophila adjuncta*, n. sp.**

Adusta group. Dark brown, thorax shining; costal cells fuscous; stigma dark brown; apical part of wing infusate; veins *Cu* and *Cu*₂ seamed with fuscous.

Length female 9.5 mm.; wing 10 mm.

Head dark fuscous, silvery-gray above; proboscis short, grayish above. Palpi brown. Antennæ short, first joint short, fuscous, joints two to five brownish-yellow, ovoidal, outer joints attenuated, brownish; pilosity of moderate length. A patch of black hair each side of occiput.

Thorax brown, shining; sides and perisutural foveæ grayish-yellow, pollinose. Scutum more distinctly pollinose. Scutellum reddish brown, shining.

Postnotum subopaque, pollinose. Pleura reddish brown, subglabrous with a faint, grayish sheen. Halteres pale, club infusate. Legs slender, sordid yellowish brown; pilosity short, grayish; coxæ and basal part of femora yellowish, tarsi fuscous. Wings light gray, costal cells fuscous, stigma elongate, dark brown, apical portion of wing infusate, veins *Cu* and *Cu*₂ seamed with fuscous. Venation as in *Limnophila terræ-novæ*** Alex.

Abdomen yellowish brown, with a fine, pale pubescence; venter yellowish. Ovipositor brown, valves slender, curved upwards, apices pale.

Holotype.—♀, Eastern Harbour, Cape Breton Islands, July 17th, 1917. (A. G. Huntsman).

A very close ally of *L. terræ-novæ*, with the description of which it agrees in all points, save that the cord and cross-veins are not seamed with fuscous; the *Rs* is longer than cell *1st M*₂—equal in *terræ-novæ*—and subangulate at the base, with a short stump of a vein. Cell *R*₂ is very narrow in its basal half, whereas it widens from the base in *terræ-novæ*.

***Tipula huntsmaniana*, n. sp.**

Very similar to *Tipula angulata* Loew. Flagellar joints of antennæ bicoloured. The pale, angulate fascia incomplete, scarcely reaching the middle of cell *M*₃; base of wing yellowish.

Male.—Length 13 mm.; wing 13.5 mm.

Head dull yellow; palpi yellowish brown, last joint dark brown and shorter than the preceding joints together. Frontal prolongation and rostrum concolorous, with a light, whitish pollinosity. Nasus short. Antennæ of moderate length, the three basal joints yellowish, joints three to ten yellowish, blackish at the base, outer joints brown. Frontal tubercle with impressed longitudinal line. Occiput with pale, yellowish-gray hairs.

Thorax yellowish gray, dull. Pronotum with dark, median spot. Præscutal stripes darker brown, ill defined; the median stripe narrowed posteriorly with a not sharply limited, median paler line, scutum dull brown, posterior border paler; scutellum and postnotum luteous, with ill-defined, median darker line. Pleura yellowish white, subsericeous; pleuro-dorsal membrane dull yellow. Halteres pale, club dark brown. Legs slender, dull, yellow; pilosity very short, blackish; coxæ yellowish white, sericeous; femora and tibiæ infusate at the tip, the latter a trifle longer than the metatarsus; tarsi fuscous. Wings with the pattern of *T. angulata*, but the pale, angulate fascia becomes narrowed in cell *M*₂ and does not extend beyond the middle of the latter cell.

Basal tergites of abdomen yellowish, becoming yellowish brown to fuscous posteriorly, with darker, median vitta; lateral margin of tergites paler. Venter similar to tergum. Eighth sternite rounded. Hypopygium yellowish brown; ninth tergite subquadrate with U-shaped median emargination, the lateral margin of the latter ends in a sharp point. Pleural suture entire; the pleurite transversely oval, the outer appendage narrow, erect, pointed, curved somewhat backward, hairy; the inner appendages consist of perpendicular plates, broadly rounded basally, narrowed upwardly and ending just below the free margin of the ninth tergite; ninth sternite with a deep, U-shaped emargination.

**Journal New York Entomological Society, vol XXIV, Pl. 8, fig. 7.

Holotype.—♂, Eastern Harbour, Cape Breton Island, N.S., Canada. (A. G. Huntsman).

A close ally also of *Tipula entomophthorae*¹ Alex., which it resembles in hypopygial structures and from which it is differentiated in the bicolored, flagellar segments and the ill-defined, thoracic stripes. It differs from *Tipula angulata* Loew and *Tipula huron* Alex.², in the angulate fascia not rendering the posterior wing-margin. *Tipula texensis* Alex.³, has the pale fascia before the stigma.

Respectfully dedicated to Dr. A. G. Huntsman.

A NEW USE FOR THE AEROPLANE.

The Department of Agriculture at Ottawa has discovered a new use for the aeroplane. The Entomological Branch is investigating the mosquito in the Lower Fraser Valley in British Columbia. By using the aeroplane, the country can be surveyed in order to map out the swampy areas and other breeding places that are readily located in photographs taken from over head, according to a statement by Dr. C. Gordon Hewitt, Dominion Entomologist, that appears in the October Agricultural Gazette. The aeroplane was used in making a comprehensive survey of the complicated water system of the Fraser River and the adjacent bodies of permanent and temporary water in that district. A flight reported by Dr. Hewitt has demonstrated the possibility of using this machine also for making surveys of timber that is being killed or has already been destroyed by various insects. Its use, it is believed, will help very greatly in the entomological work with various insects being carried on by the Federal Department of Agriculture.

THE HOUSE CENTIPEDE, CERMATIA FORCEPS RAF. IN MONTREAL.

A specimen of this Myriapod was found in a classroom of Goltman's Business College on St. Lawrence Boulevard (corner of Sherbrooke Street) on July 22, 1919, and was sent by Mr. Robert Goltman to me for the Redpath Museum where it was seen by Mr. A. F. Winn. It was kept alive feeding slightly upon house-flies until August 19th, when, by an unfortunate accident, it escaped. The species is mentioned in Comstock's Manual (p. 46) as "often found running on the walls of houses, especially in the Southern States." It was observed in Albany from 1870 onwards by J. A. Lintner, but this is believed to be the first record of its occurrence in Montreal. Lintner's account of its cleaning habits was confirmed; when cleaning the hinder limbs the body is bent sideways. The appendages of one side are cleaned in succession, beginning with the antenna.

The occurrence of this Myriapod in Canada has been recorded only once previously, a specimen having been taken in Toronto. (Can. Ent., XLVI, p. 219, 1914.)

ARTHUR WILLEY.

Two other specimens of the house centipede from Toronto have been sent me to for determination since the record cited by Prof. Willey was published.

E.M.W.

1. Can. Ent., Vol. I., p. 385.

2. Ibid., Vol. I., p., 66.

3. Ibid., Vol. XLVIII, p. 48.